

AMENDMENTS TO CLAIMS

Claim 1 (canceled)

Claims 2-19 (canceled)

Claim 20 (new): A method of reinforcing an automobile structure, comprising:

providing an elongated hollow automobile frame structure having a closed profile, the automobile frame structure defining a hollow center;

providing an elongated carrier having a longitudinal axis extending from a first open end to a second open end wherein the carrier includes:

- i) at least one opening extending therethrough;
- ii) a plurality of axially extending ribs; and
- iii) a contoured exterior surface having at least one sloping wall extending from adjacent the first open end to the second open end; and

applying a reinforcing medium to the carrier for forming a sleeve wherein the reinforcing medium is a heat activated expandable material that extends along at least a portion of the length of the carrier;

inserting the sleeve in the hollow center of the hollow frame structure such that there is a clearance between the sleeve and the automobile frame structure.

Claim 21 (new): A method as in claim 20 wherein the carrier is asymmetrical about its longitudinal axis

Claim 22 (new): A method as in claim 20 wherein the reinforcing medium is applied with a mini-applicator type extruder.

Claim 23 (new): A method as in claim 20 wherein the carrier includes a notch that aligns with a portion of the frame structure upon insertion therein.

Claim 24 (new): A method as in claim 20 further comprising forming the carrier of polymeric material by injection molding.

Claim 25 (new): A method as in claim 24, wherein the polymeric material is one selected from the group consisting of sheet molding compound and mineral reinforced polymer.

Claim 26 (new): A method as in claim 20, wherein the carrier has an offset portion that creates a clearance between the sleeve and a surface of the hollow beam upon insertion.

Claim 27 (new): A method as in claim 25, wherein the reinforcing medium is an epoxy-based polymer having foamable characteristics.

Claim 28 (new): A method as in claim 24 wherein cross-sections of the carrier taken perpendicular to the longitudinal axis narrow from the first end to the second end of the carrier.

Claim 29 (new): A method as in claim 20 wherein the reinforcing medium has a relatively high glass transition temperature and substantially covers an entire outer surface of the elongated carrier.

Claim 30 (new): A method as in claim 20 wherein a separate adhesive layer disposed upon the reinforcing medium.

Claim 31 (new): A method of reinforcing an automobile structure, comprising:
providing an elongated hollow automobile frame structure having a closed profile, the automobile frame structure defining a hollow center;
providing an elongated carrier having a longitudinal axis extending from a first open end to a second open end wherein the carrier includes:
i) at least one opening adapted for passage of components therethrough;
ii) at least one outwardly extending bracket;
iii) a plurality of axially extending ribs; and

- iv) a contoured exterior surface having a convex surface, a concave surface and at least one sloping wall extending from adjacent the first open end to the second open end; and

applying a reinforcing medium to the carrier for forming a sleeve wherein the reinforcing medium is a heat activated expandable material that extends along at least a portion of the length of the carrier;

locating an interior plate approximately at a center portion of the carrier for reinforcing the carrier; and

inserting the sleeve in the hollow center of the hollow frame structure such that there is a clearance between the sleeve and the automobile frame structure before expansion of the reinforcing medium.

Claim 32 (new): A method as in claim 31 wherein the frame structure is a pillar structure of an automotive vehicle.

Claim 33 (new): A method as in claim 32 wherein the pillar structure is selected from an A-pillar or a B-pillar

Claim 34 (new): A method as in claim 31 further comprising locating an interior plate upon the carrier, the plate including an opening for permitting the passage of components through the carrier or for permitting ventilation.

Claim 35 (new): A method as in claim 31 wherein the ribs extend inwardly relative to the carrier.

Claim 36 (new): A method as in claim 31 wherein the cross-section of the carrier taken perpendicular to the axis narrows from the first end to the second end of the carrier.

Claim 37 (new): A method of reinforcing an automobile structure, comprising:

providing an elongated hollow structure that forms at least a portion of an automotive vehicle frame, the hollow structure having one or more walls defining a hollow center;

providing an elongated carrier wherein:

- i) the carrier extends along a longitudinal axis between a first end and a second end;
- ii) an area of a cross-section taken perpendicular to the longitudinal axis adjacent the first end is substantially larger than an area of a cross-section taken perpendicular to the longitudinal axis at the second end;
- iii) the carrier defines a contoured exterior surface that is shaped to substantially correspond to the one or more walls of the hollow structure; and
- iv) the contoured exterior surface includes at least one sloping wall;

applying a reinforcing medium to the carrier, wherein:

- i) the reinforcing medium extends along at least a portion of the carrier in the direction of the longitudinal axis; and
- ii) the reinforcing medium is a sealing material that is applied to multiple surfaces of the carrier; and

inserting the carrier in the hollow center of the hollow frame structure.

Claim 38 (new): A method as in claim 37 wherein the carrier includes a bracket extending from the exterior surface for assisting in locating the carrier within the elongated hollow structure.

Claim 39 (new): A method as in claim 37 wherein the hollow structure is a pillar structure of an automotive vehicle.

Claim 40 (new): A method as in claim 37 wherein cross-sections of the carrier taken perpendicular to the longitudinal axis narrow from the first end to the second end of the carrier.